





#### **School Of Computing**



# VISION AND MISSION

## **Vision**

To produce intellectual graduates who could contribute significantly in the analysis, design, development, operation and maintenance of complex software systems for meeting the ever changing requirements of service systems and to compete globally towards professional excellence.

#### **Mission**

**M1:** Design curricula for imparting training in adapting newer computing methods and technologies for providing effective and efficient solutions to the existing / new problems.

**M2:** Emphasizing in-depth knowledge of the subjects by employing Information and Communication Technology (ICT) based pedagogy methods.

**M3:** Creating a conducive research environment for making technological innovations by the faculty and students.

**M4:** Providing leadership skills and professional ethics thereby making a prolific career in academics and industry.





# PROGRAM EDUCATIONAL OBJECTIVES

**PEO1:** The graduates of B.Tech Computer Science and Engineering will be able to formulate, solve and analyze Computer Science and Engineering problems using necessary mathematical, Scientific and engineering fundamentals.

**PEO2:** The graduates of B.Tech Computer Science and Engineering will be able to demonstrate the impact of cutting-edge technologies to accomplish social and professional responsibilities.

**PEO3:** The graduates of B.Tech Computer Science and Engineering will be able todemonstrate critical thinking, communication, teamwork, leadership skills and ethical behavior necessary to function productively and professionally.

**PEO4:** The graduates of B.Tech Computer Science and Engineering will be able to pursue higher education at reputed institution in India and abroad, work in product development companies and engage in lifelong learning.



## **INSTITUTION HEADSHIPS**



Col. Prof. Vel. Dr. R. Rangarajan
B.E. (Elec), B.E. (Mech), M.S. (Auto), D.Sc.,
Founder President & Chancellor



Dr. Sagunthala Rangarajan

MBBS

Foundress President



Mrs. Rangarajan Mahalakshmi Kishore
B.Tech, M.Tech, MBA(UK),
Chairperson & Managing Trustee



Prof. S. Salivahanan
B.E, M.E, Ph.D.
Vice-Chancellor



Prof. Dr. V. Srinivasa Rao B.E, M.E, Ph.D. Professor Dean - School of Computing



# TECHNICAL EVENTS FOR STUDENTS

- I.26 July 2022 Webinar on "Lean Startup & Minimum Viable Product/Business".
- 2.26 September 2022 One-Day Event on "Hands-on Training in Architecting with AWS Services".
- 3.24 September 2022 Webinar on "Lean Start-up & Minimum Viable Product/Business" (Second Session).
- 4. **24 September 2022** Wellness Programme on "Wholistic Wellness Series to Handle Physical and Mental Stress".
- 5.8 October 2022 Hands-on Training on "Spring Boot & Hibernate".
- 6.31 October 2022 Webinar on "Impact of AI in the 21st Century".
- 7. **I7 October 2022** Orientation

  Programme on "Transition Camp –

  Enabling the Ability to Derive Pseudo

  Code before Coding".
- 8. I4 October 2022 One-DayWorkshop on "Low Code Development Hands-on Training with Mendix Platform".
- 9. **I8 November 2022** Five-Day Faculty Development Programme on "Cloud Practitioner (AWS)".



# 66

- **Student Special Achievements** 
  - 5 November 2022 –
     Participated in Intelligent Innovators Hackathon.
  - 25–29 August 2022 Participated in Smart India Hackathon 2022.
  - 30 students participated in various placement-related activities.
  - **24 students** actively took part in co-curricular activities during the academic period.



# GENERATIVE IMAGE AI REVOLUTION

#### **Breakthrough Overview**

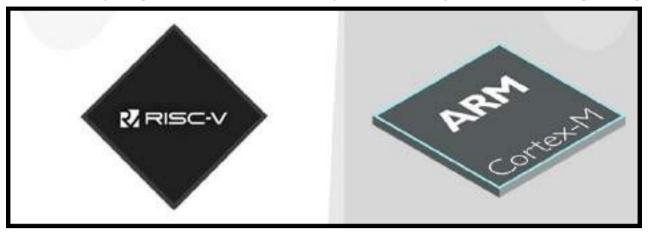
In 2023, generative image AI matured from demos to powerful creative tools, with models like DALL·E 2, Midjourney, and Stable Diffusion enabling text-to-image synthesis that reshaped design, media, and marketing workflows. Technical Specifications

- **Diffusion Models:** Iterative denoising to generate high-fidelity images from text prompts using latent diffusion backbones.
- Foundation Training: Trained on massive image-text pairs enabling broad visual concept coverage across styles and domains.
- Tooling Ecosystem: APIs and plugins integrated into creative suites and production pipelines for rapid prototyping. Applications
- Creative Production: Rapid asset generation for storyboards, ads, and concept art.
- E-commerce & Marketing: Visual A/B testing and personalized creatives at scale.
- Education & Entertainment: Visual explanation, illustration, and content ideation.
- Challenges:
  - Bias & Copyright: Training data provenance, style imitation, and fairness concerns.
- Hallucinations: Factual and compositional errors in complex scenes.
- Safety & Misuse: Deepfakes and disinformation risks requiring guardrails.
- Future Roadmap:
  - Expect controllable generation (layout, editing), safer datasets, and enterprise governance frameworks to standardize responsible deployment.

## PLACEMENT RECORD — JULY TO DECEMBER 2022

• Capgemini	-	121	students	-	₹4.25	LPA
• CGI	-	17	students	-	₹3.93	LPA
• Cisco	-	12	students	-	₹4.70	LPA
• Cognizant	-	120	students	-	₹6.75	LPA
• Comcast India	-	6	students	-	₹8.25	LPA
• Concentrix	-	26	students	-	₹3.00	LPA
• Congruent Solutions	-	3	students	-	₹2.50	LPA
• Daimler India	-	1	student	-	₹7.50	LPA
• DXC	-	10	students	-	₹4.00	LPA
• eGoverance	-	2	students	-	₹7.00	LPA
• Embitel Technologies	-	9	students	-	₹5.00	LPA
• Epikindifi	-	1	student	-	₹6.00	LPA
• Evertz India	-	1	student	-	₹5.50	LPA
• IBM Codeknack	-	1	student	-	₹4.50	LPA
• Idea Breed	-	1	student	-	₹4.50	LPA
• IDP	-	5	students	-	₹8.00	LPA
• Ignitarium Technology	-	1	student	-	₹5.00	LPA
• Infosys (SE)	-	9	students	-	₹3.60	LPA
• Jio Platforms	-	5	students	-	₹5.00	LPA
• JSW Group	-	1	student	-	₹9.50	LPA
• Accenture	-	99	students	-	₹4.50	LPA
• Acies Global	-	2	students	-	₹5.00	LPA
• ADP	-	5	students	-	₹8.80	LPA
• Amadeus Labs	-	3	students	-	₹11.70	) LPA
• Amadeus Labs (Internship)	<b>)</b> –	4	students	-	₹3.60	LPA
• Aptean	-	1	student	-	₹5.50	LPA
• Atos Global	-	2	students	-	₹3.10	LPA
• Automotive Robotics	-	7	students	-	₹3.00	LPA
• Blue Binaries	-	3	students	-	₹3.75	LPA
. BNP Paribas	_	11	students	_	₹3.00	LPA





# RISC-V CUSTOM CHIP ECOSYSTEM

#### **Breakthrough Overview**

RISC-V surged in 2023 as an open chip instruction set architecture enabling customizable, royalty-free processors, disrupting incumbent licensing models and accelerating silicon innovation.

#### • Technical Specifications

- Open ISA: Modular base and extensions (e.g., vector) for diverse domains from MCUs to datacenter CPUs.
- Custom Extensions: Domain-specific accelerators tightly coupled without licensing barriers.
- Growing Toolchain: Mature compilers, cores, and boards across the ecosystem.

#### Applications:

- Edge & IoT: Low-cost microcontrollers with tailored instruction sets.
- Al at the Edge: Custom vector and ML extensions for inference.
- Education & Research: Open platform for academic and startup chip design.
- Challenges:
  - Software Compatibility: Building robust OS and middleware stacks.
- Ecosystem Fragmentation: Managing extension sprawl and interoperability.
- Performance Parity: Matching mature vendor cores at high end.
- Future Roadmap:
  - Standardized profiles, stronger Linux support, and datacenter-class cores broaden adoption across consumer and enterprise silicon.

#### PLACEMENT RECORD — JANUARY TO JUNE 2023

Accenture	_	99	students - ₹4.50 LPA
IDP	_	5	students - ₹8.00 LPA
Acies Global	_	2	students - ₹5.00 LPA
Ignitarium Technology	_	1	student - ₹5.00 LPA
ADP	_	5	students - ₹8.80 LPA
Infosys (SE)	_	9	students - ₹3.60 LPA
Amadeus Labs	_	3	students - ₹11.77 LPA
Jio Platforms	-	5	students - ₹5.00 LPA
Amadeus Labs (Intern.)	-	4	students - ₹3.60 LPA
JSW Group	-	1	student - ₹9.50 LPA
Aptean	-	1	student - ₹5.50 LPA
Atos Global	-	2	students - ₹3.10 LPA
KPMG India	-	4	students - ₹5.00 LPA
Automotive Robotics	-	7	students - ₹3.00 LPA
LTI	-	2	students - ₹5.00 LPA
Blue Binaries	-	3	students - ₹3.75 LPA
Movidu Technologies	-	7	students - ₹7.00 LPA
BNP Paribas	-	11	students - ₹3.50 LPA
Mu Sigma	-	7	students - ₹5.00 LPA
Capgemini	-	121	students - ₹4.25 LPA
Multicoreware	-	2	students - ₹7.20 LPA
CGI	-	17	students - ₹3.93 LPA
MyCaptain	-	1	student - ₹5.00 LPA
Cisco	-	1	student - ₹24.70 LPA
Nielson IQ	-	3	students - ₹11.50 LPA
Cognizant	-	120	students - ₹6.75 LPA
Odessa Technologies	-	3	students - ₹7.50 LPA
Comcast India	-	6	students - ₹8.25 LPA
Open Text	-	32	students - ₹9.00 LPA
Concentrix	-	26	students - ₹3.00 LPA
Qube Cinema Tech.	-	1	student - ₹10.00 LPA
Congruent Solutions	-	3	students - ₹2.50 LPA
Sasken Technologies	-	6	students - ₹5.00 LPA
Daimler India	-	1	student - ₹7.50 LPA
Sharpsell	-		student - ₹8.00 LPA
DXC	-	10	students - ₹4.00 LPA
Sirius	-	1	student - ₹7.00 LPA
eGoverance	-		students - ₹7.00 LPA
TCS Digital	-		students - ₹7.00 LPA
Embitel Technologies	-		students - ₹5.00 LPA
Tejas Network	-		student - ₹10.00 LPA
Epikindifi	-		student - ₹6.00 LPA
Telestratum Networks	-		students - ₹6.00 LPA
Evertz India	-		student - ₹5.50 LPA
Virtusa	-		students - ₹5.50 LPA
IBM Codeknack	-		student - ₹4.50 LPA
Yubi	-		student - ₹15.00 LPA
Idea Breed	-		student - ₹4.50 LPA
Zoho	-	5	students - ₹8.40 LPA













































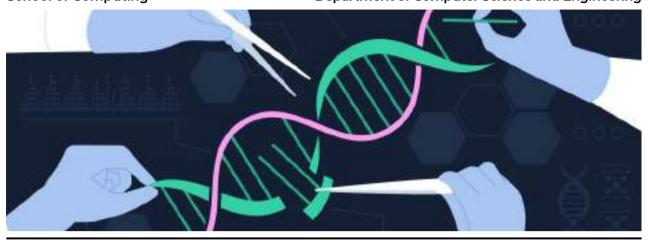












# CRISPR GENE EDITING FOR CHOLESTEROL

#### **Breakthrough Overview**

CRISPR-based therapies to reduce high cholesterol advanced, with single-dose gene edits targeting PCSK9/ANGPTL3, offering durable LDL reduction.

- Technical Specifications
  - Precise Editing: Liver-targeted genetic modifications using base/prime editing.
  - Delivery Systems: Liver-specific lipid nanoparticles.
- Applications
  - Heart Disease Patients: Treating inherited and high-risk cases.
  - **R&D Template:** Pathway for other metabolic disorders.
- Challenges
  - Safety: Keeping edits selective and monitoring immune reactions.
  - Pricing & Access: Navigating cost and distribution.
  - Regulation: Long-term impact tracking.
- Future Roadmap
  - Wider clinical trials and expansion to other gene targets are next.

#### Courses Offered by Industry / Abroad Experts

Total Number of Courses Offered: 6 Mode: Industry & Abroad Experts

Focus Areas: Cutting-edge technologies, hands-on training, and international exposure.

#### Research / Patent / Book & Book Chapter Publications

Total Publications: 2
Research Activities: I2
Patents Filed / Published: — (as per original data)
Book & Book Chapter Publications: — (as per original data)

#### 🧛 Faculty Event Participations

Total Events: 13
Faculty Participants: 32
Prize Winners: 20



#### **KIET Group of Institutions**

- 20 July 2024 B. Venkata Mamatha
  - Toding Ninjas Goodies
  - Faculty Mentor: Ms. Vaishnavi R.
- 13 August 2024 Dadi Hari Rama Krishn
- 🏅 Prize: Nil
- Faculty Mentor: Dr. Rajesh Kambattan
- 25 August 2024 Anubothu Lavanya
- 🏅 Prize: Nil
- 🧛 Faculty Mentor: Dr. Seethalakshmi K



# STUDENT CO- & EXTRA-CURRICULAR ACTIVITIES JULY 2022 – DECEMBER 2023

#### SNS College

- 25 August 2024 Deepanshu Singh 🎖 Prize:
  - Faculty Mentor: S. Durai
- 25 August 2024 Raghav Rajvanshi
- T ₹ 1000 Cash Prize
- Faculty Mentor: Mr. Alex David
- 29 August 2024 Animesh Das
  - Prize: No
  - 🧛 Faculty Mentor: Dr. J. Vishumathi

## Yel Tech Rangarajan Dr. Sagunthala R&D Institute of Science and Technology

- 9 September 2024 Sumit Raj
  - 🏅 Prize: No
- **Faculty Mentor:** Dr. R. Parthasarathy
- 14 September 2024 Sumit Raj
- ₹ 5000 Cash Prize
- Faculty Mentor: Dr. R. Parthasarathy
- 22 September 2024 Saquib Alam
  - **Toding Ninjas Goodies**
- 🧛 Faculty Mentor: Ms. Femi D.



# MAINSTREAM LLMS AND COPILOTS

#### **Breakthrough Overview**

From late 2022 through 2023, LLMs such as GPT-4 catalyzed copilots and NL interfaces for coding, support, and document workflows across enterprises.

#### Technical Specifications

- Transformer LLMs: Instruction tuning and RLHF alignment.
- o Multimodality: Text, vision, and code understanding.
- o Integration: Plugins, retrieval augmentation, and tool use in apps.

#### Applications

- **Software Dev:** Code generation, refactoring, tests.
- Knowledge Work: Drafting, summarization, analytics.
- Customer Ops: Conversational support and routing.

#### Challenges

- Hallucinations: Reliability in high-stakes tasks.
- **Security:** Prompt injection, data leakage, governance.
- o Cost/Latency: Serving large contexts efficiently.

#### Future Roadmap

• Improved reasoning, domain-specialized models, and tighter enterprise controls are expected.

SALFORD MAGAZINE MARCH 2026

# STUDENT CO- & EXTRA-CURRICULAR ACTIVITIES OCTOBER - NOVEMBER 2022

#### ↑ Virtusa

• \* 12 October 2022 — Midde Venkata Dhanush Gupta

**7 Prize:** No

Faculty Mentor: Mr. Karthikeyan V

• 🔭 13 October 2022 — Rahul Kumar

**7 Prize:** No

**Faculty Mentor:** Mr. K. Antony Kumar

• 🔭 13 October 2022 — Abhinav Anand

7 ₹ 5000 Cash Prize

Faculty Mentor: Dr. Ravi Kumar S

## Yel Tech Rangarajan Dr. Sagunthala R&D Institute of Science and Technology

• 14 October 2022 — Pritam Kumar

7 ₹ 5000 Cash Prize

Faculty Mentor: Mr. Vivek Justus

• 14 October 2022 — Jakka Rishi Kumar

🏅 Prize: Nil

Faculty Mentor: Mr. Prabhakaran

• 15 October 2022 — Chilukuri Sai Mani

**7 Prize:** Nil

Faculty Mentor: Ms. S. Hannah Mam

• **26 October 2022** — K. Lokesh

Prize: Nil.

🛂 Faculty Mentor: Dr. N.K. Senthil Kumar

• 28 October 2022 — Rahul Kumar

Prize: Nil.

🧛 Faculty Mentor: Mr. K. Antony Kumar

• 28 October 2022 — G. Lokesh Reddy

Prize: Nil

Faculty Mentor: Ms. U. Hemavathi

• 29 October 2022 — Siva Sankar Thivaladinn

Y ₹ 3000 Cash Prize

Faculty Mentor: Ms. Kanchana Devi K

• 29 October 2022 — Siva Sankar Thivaladinn

₹ 4000 Cash Prize

Faculty Mentor: Ms. Priya



#### Tongunadu College of Engineering

• 21 October 2022 — Yeluri Praveen Sai

**7 Prize:** Nil

Faculty Mentor: Dr. K. R. Sindhuja

#### VelTech University

• 23 October 2022 — Abhinakk Gaire

¶₹ 1000 Cash Prize

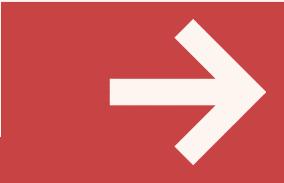
Faculty Mentor: Dr. Arun M

#### **↑** Web3 For All

• 4 November 2022 — Atham Dinesh

**¾** ₹ 20,000 Cash Prize

🧛 Faculty Mentor: Mr. Elumalaisamy P





# MAINSTREAM LLMS AND COPILOTS

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- Security: Prompt injection, data leakage, governance.
- o Cost/Latency: Serving large contexts efficiently.

#### Future Roadmap

• Improved reasoning, domain-specialized models, and tighter enterprise controls are expected.



# STUDENT CO & EXTRA CURRICULAR ACTIVITIES



Project Title: The Relentless and Realtime

**Smart Worker Suit and App** 

**Objective:** To design and develop a smart helmet and clothing system for mining industry applications.

**Date:** 25–29 August 2022

**College:** KIET Group of Institutions

Place: Delhi Result: Finalist

#### Team Members:

Deepanshu Singh (VTUL2311), Animesh Das (VTUL6808), Ankit Kumar (VTUL1992), Nitin Das (VTU16807), Shay Rajvanshi (VTUL2050), Anubothu

Lavanya (VTU14461)

#### STUDENT SPECIAL ACHIEVEMENTS JAN 2023 - JULY 2023

Major Events Conducted for Students for the Academic Year 2022–2023 rewarded with Cash Prizes and Merit Certificates

S.No	Date of Event	Event Name	Faculty Coordinator	Total Number of Students
1	28.10.2022	Codethon-22	Mrs.K.Prema	46
2	29.10.2022	Idea Contest-22	Mrs.P.Arvibraka	64
3	31.1.2023	Codethon-23	Mrs.P.Arvibraka	41
4	27.03.2023	Coding Champions-23	Mrs.P.Arvibraka	51
5	5 29.03.2023 Idea Contest-23		Mrs.K.Prema	46
6	31.03.2023	Prakalpaz-23	Mr.Kishore Kumar	29



## AI-DISCOVERED ALGORITHMS (MATRIX MULTIPLICATION, MAX-FLOW)

#### **Breakthrough Overview**

In 2022, researchers used ML to discover faster algorithms for matrix multiplication and achieved breakthroughs in classical max-flow, signaling a new era in Alaugmented algorithm design.

#### • Technical Specifications

- Neuro-symbolic Search: ML-guided exploration of algorithmic spaces.
- **Improved Bounds:** New matrix mult variants; "absurdly fast" max-flow algorithm.

#### Applications

- ML/Graphics: Faster linear algebra kernels.
- Networks & Logistics: Improved flow computations.

#### Challenges

- Generality: Ensuring robustness beyond benchmarks.
- o Interpretability: Understanding learned algorithm structure.

#### Future Roadmap

• Hybrid ML + theory pipelines for broader classes of core algorithms.

Participation and Prize Winners						
S.No	S.No Event Name Participated					
1	Hackathon	152	12			
2	Idea Contest	96	16			
3	Quiz	252	10			
4	Coding Competitions	350	38			
5	Tech Fest	402	9			
6	Paper	50	0			
7	Non-Technical	71	1			
	Total	1482	86			

#### STUDENT SPECIAL ACHIEVEMENTS Jan 2023- July 2023



Dinesh Aitham Has awarded **Rs.20,000** in Ur-Hackathon

**Date of Event:** 4.11.2023-8.11.2023



Pratyush De VTU 12070 Dipta Talukder VTU 28596 **Awarded Rs. I lakh** grant CHANAKYA Fellowship Program of IITI DRISHTI CPS Foundation Foundation under NM-ICPS scheme for the project Faculty Mentor:Dr. N. Malarvizhli,-Professor-CSE

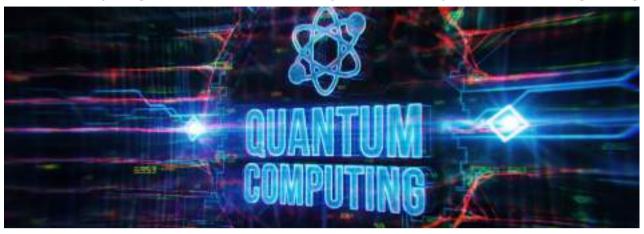


Kavya VTU 20414

For **award of Rs.2034** for appreciation of writing a book



VTU-16970 ANIKET KUMAR VTU 17178-MANISH KUMAR VTU17060-UTKARSH Rewared and received **cash prize of Rs.15,000** in Texus Hackatoge Organized by:SRM-Ramapuram Faculty Mentor:Dr.M.Kavitha-Professor/CSE



## QUANTUM COMPUTING MOMENTUM (SOFTWARE STACKS & USE-CASES)

#### **Breakthrough Overview**

In 2023, quantum advanced via better software toolchains, error-mitigation workflows, and early application mappings for chemistry, optimization, and cryptography.

#### **Technical Specifications**

- o **QSDKs:** Circuit transpilers, pulse-level control, and error mitigation.
- Hybrid Workflows: Classical-quantum variational loops.
- Early Hardware Targets: NISQ devices with limited qubits/depth.

#### Applications

- Materials/Chemistry: Hamiltonian simulation pilots.
- Optimization: Heuristics for routing and scheduling.
- Security: Post-quantum crypto transition planning.

#### Challenges

- Error Rates: Decoherence and scaling fidelity.
- Practical Advantage: Demonstrating concrete speedups.

#### Future Roadmap

 Error-corrected prototypes, chiplets/cryogenic control, and domain-specific compilers.



#### .Net Framework (Subject Code: 1157CS110) 👤 Resource Person: Mr. Syed Mohammed Nisar Alam, CEO, Crescent Technosoft, Bangalore Date: 16.08.22 – 18.08.22 | 👶 Hours: 15 | 🎓 Credits: 1 | 👤 Students Registered: 54 Angular JS (Subject Code: 1157CS982) 👤 Resource Person: Mrs. Karthika, Lead Software Engineer, TVS NEXT Limited, Chennai Date: 02.09.22 – 17.09.22 | 🔅 Hours: 15 | 🎓 Credits: 1 | 🚅 Students Registered: 58 DevOps (Subject Code: 1157CS956) 👤 Resource Person: Dr. T. Nallasamy, Manager – Operations, Cognizant Technologies, IITM, Chennai Date: 20.08.22, 27.08.22, 02.09.22 | 🙆 Hours: 15 | 🎓 Credits: 1 | 🕵 Students Registered: 60 Reactive JS (Subject Code: 1157CS996) 👤 Resource Person: Mr. Ganapathi Raghavan, Technical Lead, Inova Solutions Date: 09.09.22, 10.09.22, 24.09.22 | 🙆 Hours: 15 | 🎓 Credits: 1 | 🚅 Students Registered: 51 ■ Augmented Reality / Virtual Reality (Subject Code: 1157C1118) 👤 Resource Person: Mr. Srinivasan Vangapannavarapu, Founder & CEO, GRAHAs VR Date: 12.09.22, 13.09.22, 16.09.22 | 🙆 Hours: 15 | 🎓 Credits: 1 | 🕵 Students Registered: 47 (Subject Code: 1157CS119) 👤 Resource Person: Mr. Mohd Waseem Ansar S., UI/UX Designer, WTL Studios Pvt. Ltd., Hyderabad Date: 19.09.22 – 21.09.22 | 👶 Hours: 15 | 🎓 Credits: 1 | 🚅 Students Registered: — Performance Theory and Evaluation (Subject Code: 1157CS123) Resource Person: Prof. Dr. Hee Yong Youn, Sungkyunkwan University, South Korea Date: 12.09.22 – 16.09.22 | 👸 Hours: 15 | 🎓 Credits: 1 | 🚅 Students Earned Credit: 36

III Performance Modelling and Simulation (Subject Code: 1157CS122)

■ Resource Person: Prof. Dr. Hee Yong Youn, Sungkyunkwan University, South Korea

Date: 22.08.22 − 31.08.22 | 🕭 Hours: 15 | 🎓 Credits: 1 | 🚅 Students Earned Credit: 46



# PASSWORDLESS LOGIN (PASSKEYS/FIDO2)

#### **Breakthrough Overview**

Passwordless authentication gained mainstream rollout in 2022–2023 with platform passkeys based on FIDO2/WebAuthn, reducing phishing and credential reuse.

#### **Technical Specifications**

- Public-Key Auth: Device-bound credentials and user verification.
- Cross-Platform Sync: Secure enclave-backed cloud sync.
- WebAuthn APIs: Broad browser and OS support.

#### Applications

- Consumer Apps: Safer sign-in flows at scale.
- Enterprise SSO: Reduced helpdesk resets and risk.

#### Challenges

- **Device Loss/Migration:** Recovery UX and policy design.
- Legacy Systems: Bridging to older auth stacks.

#### • Future Roadmap

 Wider issuer support, enterprise policy tooling, and hardware key coexistence.

#### **INDUSTRY PROGRAM JAN 2023- JULY 2023**

A series of hands-on, industry-driven courses designed to bridge academia and real-world applications.

#### 

Course Title	Resource Person	Dates	(L) Hrs	cr	<b>⊈</b> Students
<u>@</u> ML Ops	Dr. Shanmugakumar Murugesan	31 Jan, 24-25 Mar 2023	15	1	29
UI/UX Development	Ms. Merlin – Thinkworks	8-10 Mar 2023		1	59
⊕ Metaverse	Mr. Y. Srinivasan – Founder & CEO	14-16 Feb 2023	15	1	59
<b>⇔</b> DevOps	DevOps Anil Kumar Sandrapuri – Technical Solutions		15	1	60
iOS Apps Development	Mr. Narendh Subramani – Senior App Developer	19, 23 & 25 Mar 2023	15	1	59
ARM Dr. P. Rohini – IIITDM Architecture		6, 20 & 21 Apr 2023	15	1	51
Federated Learning	Vimalkumar Kumaresan – Data Science Manager	17 Mar, 6 & 8 Apr 2023	15	1	60

### ABROAD PROGRAM (IHL) JAN 2023- JULY 2023

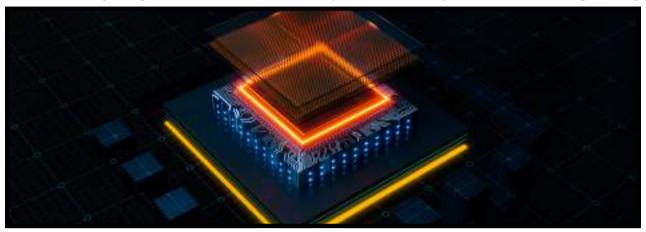
A total of 13 international courses were conducted in collaboration with leading universities from the USA, UK, South Korea, and Malaysia.

These programs provided students with hands-on global exposure, totaling 814 participants with 803 students earning credits.

#### **Notice** Notice Notice

- 🚣 AR / VR & App Development
- Internet of Things (IoT)
- == FinTech
- Usersecurity & Digital Forensics

Domain	Courses (Examples)	Resource Person / University	Students
Artificial Neural Networks, Deep  Martificial Neural Networks, Deep  Learning, CNN, AI Systems, Fundamentals		Prof. Shridhar (Univ. of Michigan, USA), Prof. Keshav Dahal (UK)	315
🚣 AR / VR & App Dev.	Game Dev for Android, Virtual & Augmented Reality, GUI Design using iOS		180
⊕ Internet of Things (IoT)  Theory & Application of Smart IoT, HW/SW for Smart IoT		Prof. Hee Yong Youn (Sungkyunkwan Univ., South Korea)	133
➡ FinTech Financial Technology		Prof. Keshav Dahal (Univ. of West Scotland, UK)	70
Cybersecurity & Forensics			116



# CHIPLETS AND MODULAR SOC DESIGN

#### **Breakthrough Overview**

By 2023, chiplet architectures and standardized interconnects rose to prominence, enabling modular SoCs and heterogeneous integration for performance and yield gains.

- Technical Specifications
  - **Die-to-Die Links:** Standardized high-bandwidth interconnects.
  - Heterogeneous Stacks: Mix-and-match nodes and IP.
  - Packaging: Advanced 2.5D/3D integration.
- Applications
  - Datacenter CPUs/GPUs: Scalable compute tiles.
  - Al Accelerators: Memory/compute disaggregation.
- Challenges
  - Ecosystem Standards: Interop and validation.
  - Yield/Cost Models: Supply-chain complexity.
- Future Roadmap
  - Open standards, broader vendor support, and EDA flows for chiplet codesign.





Prof. Dr. Keshav Dahal, University of the West of Scotland, Scotland, UK 1157CS976 – Financial Technology



Prof. Dr. Jey Chelladurai, East Stroudsburg University, USA 1157CS126 – Game Development for Android



#### **School of Computing**



# RESPONSIBLE AI AND SAFETY TOOLING

#### **Breakthrough Overview**

In 2023, Al safety moved from discourse to practice with red-teaming, evals, and policy-in-product, shaping deployment of generative Al in production.

#### Technical Specifications

- Alignment/Evals: Benchmarks for toxicity, bias, and jailbreaks.
- **Guardrails:** Prompt filtering, content moderation, policy engines.
- Observability: Telemetry for drift and misuse detection.

#### Applications

- Enterprise Al: Safer copilots and assistants.
- Platforms: API-level safety net enforcement.

#### Challenges

- Coverage: Evals lag new attack classes.
- **Trade-offs:** Safety vs capability/latency.

#### • Future Roadmap

 Standardized eval suites, third-party audits, and regulatory compliance integration.

# PATENTSDETAILS JAN 2023- JULY 2023

A total of 9 patents were filed and published/granted during this period, showcasing the department's strong focus on innovation and research.

#### **Highlights**

• Total Patents Filed: 9

• Faculty Involved: 6

• Earliest Filed: Jan 11, 2023

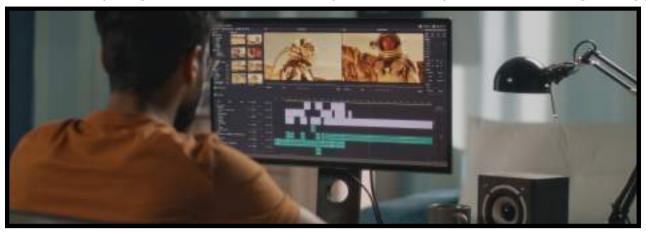
• Latest Published: Jun 27, 2023

• Major Domains: Al, IoT, Smart

Systems, Assistive Technology.



Faculty Name	ne Patent Title		Published / Granted
Dr. Chidambaranatha	Artificial Intelligence	Feb 18, 2023	Mar 17, 2023
Dr. M. Sankar	Milk Adulteration Monitoring	Jan 11, 2023	Mar 20, 2023
Dr. M. Sankar	Sun Tracking Solar Panel	Jan 11, 2023	Mar 20, 2023
Dr. M. Sankar	Wearable Medical Monitoring	Jan 11, 2023	Mar 20, 2023
Dr. M. Sankar	Street Light	Jan 11, 2023	Mar 16, 2023
Dr. P. J. Beslin Pajila	IoT Enabled Energy Efficient System	Mar 27, 2023	Jun 27, 2023
Dr. N. K. Senthil Kumar	IoT-driven Design System	Apr 20, 2023	May 5, 2023
Dr. Arun Kumar M. S	Walking Stick for Visually Impaired	May 27, 2023	Jun 6, 2023
Dr. Angeline Lydia	Obstacle Detection System	Apr 17, 2023	May 19, 2023



# AI VIDEO GENERATION AND EDITING

#### **Breakthrough Overview**

2023 brought rapid progress in text-to-video and video-editing models, enabling creators to generate and manipulate footage with unprecedented control.

- Technical Specifications
  - **Diffusion/Transformers:** Spatiotemporal generation and editing.
  - Control Signals: Masks, keyframes, and prompts for edits.
  - Multimodal I/O: Text, image, and video conditioning.
- Applications
  - **Post-Production:** Object removal, relighting, style.
  - Marketing & Social: Rapid creative iteration.
- Challenges
  - Temporal Consistency: Coherence across frames.
  - Copyright/Authenticity: Provenance and watermarking.
- Future Roadmap
  - Higher resolution/length, better controls, and authenticity standards.

PATENT DETAILSJULY 2022- DEC 2023

A total of 6 patents were filed, published, or granted during this period — highlighting the department's active contribution to research and innovation

#### **Patent Highlights**

• Total Patents: 6

Published: 4 | Granted: | |

Filed:

• Faculty Involved: 6

• **Key Domains:** IoT, AI, Healthcare, Smart Systems



Faculty Name	Faculty Name Patent Title		D Patent No.	¶7 Year
Siva Rama Lingham N	IoT-driven Platform using AR Siva Rama Lingham N Exergaming for Assessing Physical & Mental Activities		202241030368	2022
Conceptual Framework for Changing Dr. S. Saravanan Demands in Indian Healthcare Services		Published	202241047655 A	2022
Dr. T. Kamaleshwar	Cloud & IoT based Implementation of Intelligent E-Mirror System using Python	Published	202141049776	2022
Dr. S. Koteeswaran  ML Based Heart Patient Sensing &  Monitoring Method		Filed	202231046237	2022
Mr. Prabakaran K	IoT Driven Smart Carbon Monitoring using Al	Published	202241045444	2022
Dr. V. Dhilip Kumar  Volatile Components Collection Unit with Incineration of Crude Plant		Granted	2021103575	2022

#### **School of Computing**



# DEVELOPER AI TOOLING (CODE GEN & AGENTS)

#### **Breakthrough Overview**

From 2022–2023, Al coding assistants evolved into multi-file code generators and task agents, speeding development and testing cycles.

#### **Technical Specifications**

- Code LLMs: Instruction-tuned, repo-grounded generation.
- **IDE Integration:** Inline suggestions, refactors, test scaffolds.
- Tool Use: Docs retrieval, linters, and build orchestration.

#### Applications

- Feature Dev: Boilerplate and pattern scaffolding.
- QA: Test generation and bug localization.

#### Challenges

- Correctness: Subtle logic errors and license contamination.
- Context Limits: Large repos and dependency graphs.

#### Future Roadmap

 Stronger reasoning, repo-wide context, and secure, auditable code generation workflows. PATENT DETAILSJULY 2022- DEC 2023

The department demonstrated strong innovation through 7 patents in this period — spanning IoT, AI, healthcare, and smart systems.

#### Patent Highlights

• Total Patents: 7

• Published: 5 | Granted: 1 |

Awaiting: |

• Faculty Involved: 6

• Domains: IoT, Al, Big Data,

Healthcare



Faculty Name	Patent Title	📌 Status	D Patent No.	17 Year
Dr. V. Dhilip Kumar	AI, IoT based real-time condition monitoring of electrical machines using Python	Published	202241015285 A	2022
Dr. V. Dhilip Kumar	IoT-driven water quality monitoring Or. V. Dhilip Kumar system and removal of foul smell from wastewater		202241013945 A	2022
Dr. N. Rajkumar	Managing IoT data processing with Big Data & ML techniques	Published	202211049067	2022
Dr. N. Malarvizhi	Non-invasive glucometer	Applicatio n Awaiting	202241047232	2022
U. Hemavathi	AI, IoT based real-time condition monitoring of electrical machines using Python	Published	202241015285 A	2022
Dr. P. S. Ramesh	AI-based pollution monitoring system using smart IoT	Published	202241049371	2022
Dr. S. Jagan	AI & IoT-based system for monitoring volume of fuel pumped into an automobile	Granted	2021103863	2022



# VECTOR DATABASES FOR RAG

#### **Breakthrough Overview**

In 2023, purpose-built vector databases (e.g., Pinecone, Milvus) became core infrastructure for retrieval-augmented generation, powering semantic search over embeddings to ground LLMs in enterprise data.

#### **Technical Specifications**

- **Approximate Nearest Neighbor:** HNSW/IVF/graph indexes for high-dimensional vectors.
- **Filtering and Hybrid Search:** Metadata filters and vector+keyword fusion for relevance.
- Scale & Ops: Horizontal sharding, streaming inserts, and rolling upgrades for uptime.

#### Applications

- RAG & Agents: Context retrieval to reduce hallucinations in LLM apps.
- Recommendation & Dedup: Similarity matching across text, image, audio embeddings.

#### Challenges

- Consistency & Deletions: Maintaining recall with frequent updates and filtering.
- Cost/Latency: Balancing recall, precision, and query speed at scale.

#### • Future Roadmap

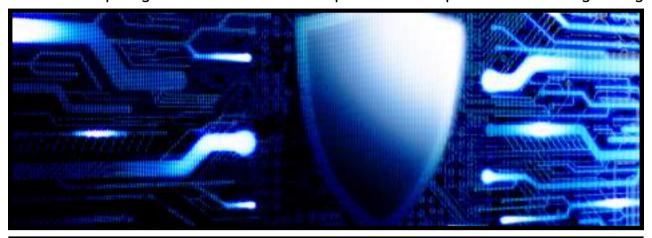
• Tighter integration with embedding benchmarks, standardized evals, and vector+graph+text multimodal stores.



# RESEARCH / PATENT / BOOK & BOOK CHAPTER PUBLICATIONS July 2022-Dec 2022

This period reflects the department's commitment to academic excellence and innovative research, with impactful contributions in the areas of machine learning, IoT, healthcare, and smart city applications.

#	Title	Authors	Journal / Volume / Issue	Date
1	An Effective and Secure Mechanism for Phishing Attacks Using a Machine Learning Approach	Mohamed G, Visumathi J, Mahdal M, Anand J, Elangovan M	Processes – Vol. 10(7)	Jul 2022
2	A crop yield prediction model based on an improved ANN and yield monitoring using a blockchain technique	M. Sumathi, M. Rajkamal, S. P. Raja, M. Venkatachalapathy, N. Vijayaraj	Int. Journal of Wavelets, Multiresolution and Information Processing, Vol. 20(6)	Aug 2022
3	Analysis of Skin Cancer and Patient Healthcare Using Data Mining Techniques	N. Arivazhagan et al.	Volume 2022	Sep 2022
4	Energy Aware Seagull Optimization-Based Unequal Clustering Technique in WSN Communication	D. Anuradha, Srinivasan R, Anil Kumar T. Ch, Banu J.F., Pundir A.K.S, Babu D.V	Vol. 32(3), pp. 1325–1341	Sep 2022
5	Human-Centered Applications in Sustainable Smart City Development: A Qualitative Survey	Xu Wei, Mengyu Ruan, Thanjai Vadivel, J. Alfred Daniel	Supplementary Issue 4 – Cognitive Systems for Cyber Security in the Digital Era	Sep 2022



# CONFIDENTIAL COMPUTING WITH ATTESTATION

#### **Breakthrough Overview**

By late 2022 and into 2023, confidential computing formalized remote attestation as essential, enabling verifiable TEEs so code and data can be protected even from cloud operators.

#### • Technical Specifications

- **TEEs:** Hardware-isolated enclaves (e.g., SGX/SEV/TDX) with cryptographic measurements.
- **Remote Attestation:** Evidence proving enclave identity and state to external verifiers.
- RA-TLS/Secure Key Release: Policy-based decryption gated on verified measurements.

#### Applications

- **Secure ML & RAG:** Privacy-preserving inference and data processing in the cloud.
- **Key Management:** Conditional key release tied to verified runtime state.

#### Challenges

- UX & Policy: Managing device loss, migration, and attestation policy complexity.
- **Ecosystem Fragmentation:** Divergent TEE implementations and standards.

#### Future Roadmap

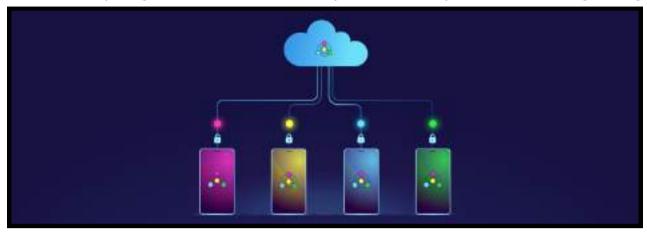
 Stronger, standardized attestation formats and tooling integrated into mainstream cloud runtimes.



# RESEARCH / PATENT / BOOK & BOOK CHAPTER PUBLICATIONS Jan 2023- june2023

13 - SCI PAPERS PUBLISHED 18 SCOPUS
PAPERS PUBLISHED
18 STUDENT AND FACULTY PUBLICATION
22 CONFERENCE PAPER PUBLISHED

#	Title (Shortened)	Authors (Lead)	Journal / Publisher	Month 2023
1	Marine Predator Optimization for Shrimp Prediction	Prema K., Visumathi J.	IJRITCC	Mar
2	Hypothyroid Prediction Model	Shyamala Devi M. et al.	Sensors	Mar
3	Pneumothorax Diagnosis	V. Dhilip Kumar et al.	MDPI Diagnostics	Mar
4	BP Neural Network for Teaching Quality	Guru Vimal Kumar M. et al.	Journal of Applied Sciences	Jan
5	Smart Cataract Detection with Bi-LSTM	Kalyani B.J.D. et al.	Soft Computing	Feb
6	CNN for Strawberry Disease Prediction	Shyamala Devi M. et al.	IEEE Xplore	Apr
7	DR-NAP for WSN	A. Kavitha et al.	Wiley IJCS	May
8	Parallel Mirrors + Deep Learning (Shrimp)	Prema K., Visumathi J.	IJRITCC	Apr
9	E-Learning Recommendation System	Manikandan N.K., Kavitha M.	Intelligent & Fuzzy Systems	Jun
10	Image Clustering & Feature Extraction	Bhuvanya R., Kavitha M.	Cybernetics & Info. Tech.	Jun



# FEDERATED LEARNING AT SCALE

#### **Breakthrough Overview**

Federated learning matured as a practical pattern for decentralized model training across devices and edges in 2022–2023, improving privacy and enabling cross-organization collaboration without raw data sharing.

#### Technical Specifications

- Aggregation: Secure parameter aggregation (e.g., FedAvg variants) under non-IID data.
- **Edge Integration:** Hybrid cloud/edge pipelines and programmable IoT setups for on-site training.
- Security Enhancements: FL for intrusion detection and privacy-preserving analytics.

#### Applications

- Mobile/IoT: On-device personalization without centralizing data.
- Security/IDS: Collaborative anomaly detection across organizations.

#### Challenges

- Heterogeneity: Stragglers, connectivity, and non-IID drift.
- Privacy Guarantees: Robustness against gradient leakage and poisoning.

#### Future Roadmap

 Tighter DP/secure aggregation, robust aggregation against adversaries, and standardized FL ops stacks.

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## **BOOK & BOOK CHAPTERS**

Jan 2023- July 2023

The publication record of the author includes a total of 18 works. This comprises 6 books and 12 book chapters, reflecting a diverse contribution to academic literature.



#### Dr. M.A. Mukunthan

• Book: Database Management – Shanlax (Jan 2023)

#### Dr. P.S. Ramesh

- Book: Blockchain Technologies Book Rivers (Mar 2023)
- Book Chapter: A Novel Model for IoT Blockchain System Design for Epidemics (Feb 2023)

#### Mr. Muthukrishnan

• Book Chapter: A Secure Quantum – IGI Global Publisher (Mar 2023)

#### Dr. M. Shyamala Devi

- · Book Chapters:
  - Cognitive Science and Technology Springer (Jan 2023)
  - System Design for Epidemics Springer (Feb 2023)
  - Lecture Notes in Networks and... Springer (Feb & Mar 2023)
  - A Novel 18-Convolutional Springer (Feb 2023)

#### Dr. S. Jagan

• Book: Machine Learning – Springer (Jan 2023)

#### Dr. V. Dhilipkumar

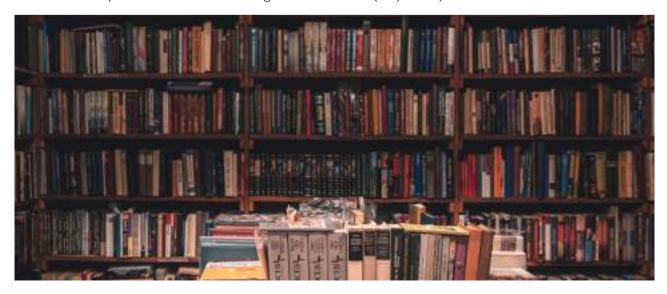
- Book: System Design for Epidemics Springer (Feb 2023)
- Book Chapter: Deep Convolutional Springer (Feb 2023)

#### Dr. S. Vinoth Kumar

• Book: Big Data Technologies – Evincepub Publishing (Apr 2023)

#### N.R. Raalakshmil

• Book Chapter: Blockchain-based Big Data – Elsevier (May 2023)





# WEB ASSEMBLY COMPONENT MODEL AND WASI PREVIEW 2

#### **Breakthrough Overview**

In 2023, the WebAssembly ecosystem advanced with the Component Model and WASI Preview 2, enabling portable, modular components and standardized system interfaces beyond the browser, boosting multi-language services and edge runtimes.

#### • Technical Specifications

- Component Model: A canonical ABI with WebAssembly Interface Types (WIT) for composing components across languages and runtimes.
- WASI Preview 2: Revamped IO, filesystem, clocks, sockets, and random APIs defined in WIT, plus "worlds" like CLI for non-browser execution.
- Threads/GC Work: Progress on Wasm threads and garbage collection to support higher-level languages and concurrency.

#### Applications

- **Polyglot Microservices:** Language-agnostic modules that interoperate across servers, edge, and serverless platforms.
- Portable Apps: Consistent system calls across OSes without containers.

#### Challenges

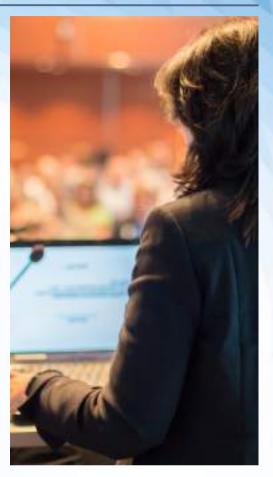
- Maturity Gaps: Evolving specs, runtime support variance, and tooling catch-up.
- Adoption Complexity: Migration from Preview 1 and aligning with component registries.

#### Future Roadmap

• Broader runtime support, language toolchains (Rust cargo-component, JS jco), and stabilization toward WASI 1.0 drive mainstream adoption.

## **FACULTY EVENT PARTICIPATION Jan 2023- July 2023**

Domain Name	Number of Faculties Participated
Cyber Security	8
Machine Learning & Deep Learning	60
Internet of Things & Industry 4.0	15
Artificial Intelligence & NLP	45
Data Visualization	3
Teaching & Learning	10
Computer Vision & Data Science	29
Big Data Analytics	7
Image Processing	5
AWS	10
Blockchain Technology	12
Cloud Computing	27
Middleware Technologies	43
Network Security	29
Web / Mobile Application Development	5
Programming	5
IPR & Research	40
Digital Workspace & Virtualization	3
Mainframe System Administration	3
Others	10



Total
Faculty
Participated
1,482
Prize
Winners: 86



# FLASHATTENTION AND FLASHATTENTION-2 FOR TRANSFORMERS

#### **Breakthrough Overview**

Starting in 2022 and accelerating in 2023, FlashAttention and FlashAttention-2 reengineered the attention kernel to be IO-aware, delivering large speedups and longer contexts for Transformers without approximation.

#### Technical Specifications

- **IO-Aware Tiling:** Minimizes HBM↔SRAM traffic via blockwise computation while preserving exact attention.
- Parallelism Optimizations: FlashAttention-2 improves work partitioning across thread blocks/warps, boosting FLOPs utilization on GPUs.
- **Open Implementations:** Reference kernels and libraries available for integration into major frameworks.

#### • Applications

- LLM Training/Inference: Faster training and extended sequence lengths for GPT/BERT-style models.
- **Multimodal Models:** More efficient attention for image, audio, and video transformers.

#### Challenges

- **Hardware Specificity:** Tuning for different GPU architectures and memory hierarchies.
- Integration Effort: Adapting kernels across frameworks and custom model stacks.

#### • Future Roadmap

 Further kernel fusion, scheduler optimizations, and alignment with long-context architectures to approach GEMM-like efficiency.

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## Faculty Event Participations July 2022- Dec 2023

<i>D</i>	Evente i ai deipad			
Faculty Name	Title of the Event	Start Date	End Date	Institutions / Industry
Dr. N.R. Rajalakshmi	Artificial Neural Network	Nov 8, 2022	Nov 12, 2022	Professor
V. Usha	Artificial Neural Networks	Nov 8, 2022	Nov 12, 2022	Department of CSE, Vel Tech
Najem Dhean Abdul Majeeth	Application of Machine Learning in Electric Drives	Oct 7, 2022	Oct 8, 2022	SSN College of Engineering
M. Divya	Offering Short-Term Course on "Python Programming for Data Science"	Dec 27, 2022	Dec 31, 2022	NIT
Syed Fiaz A.S	Industry 4.0	Dec 5, 2022	Dec 9, 2022	Easwari Engineering College, Chennai
Shamuga Priya S	Recent Trends in Artificial Intelligence and Cyber Security	Nov 1, 2022	Nov 5, 2022	Shri Vishnu Engineering College for Women
Dr. G Tamilmani	Recent Trends in Artificial Intelligence and Cyber Security	Nov 1, 2022	Nov 5, 2022	Shri Vishnu College of Engineering
Dr. G Tamilmani	ANN	Nov 8, 2022	Nov 12, 2022	Vel Tech
Dr. Visumathi J	Introduction to Machine Learning and its Research Perspective	Nov 24, 2022	Nov 24, 2022	WWNN
U. Hemavathi	One Day Hands-On Training Programme on "Spring Boot" and Microservices	Oct 8, 2022	Oct 8, 2022	NIT
Dr. M. Gokulshdev	Soft Skills for Teachers	Oct 17, 2022	Oct 21, 2022	NITTTR
P. Arivubakaran	Cloud Practitioner – AWS	Nov 24, 2022	Nov 25, 2022	ICT Academy
Kishore Kumar K	Cloud Practitioner	Nov 24, 2022	Nov 25, 2022	ICT Academy
Sri Raman K	5 Days FDP on Artificial Neural Network	Nov 8, 2022	Nov 12, 2022	Dept of CSE
Siva Rama Lingham N	Cloud Practitioner (AWS)	Nov 24, 2022	Nov 25, 2022	ICT Academy
Prabakaran K	Industry 4.0	Dec 5, 2022	Dec 9, 2022	Easwari Engineering College
Dr. Visumathi J	Predictive Analytics on Computing Technologies	Dec 5, 2022	Dec 9, 2022	ATAL
Prema S	Python Programming: A Practical Approach	Dec 14, 2022	Dec 9, 2022	Velammal Institute of Technology
Nandhini A	AI for All	Nov 23, 2022	Dec 3, 2022	AICTE & EduSkills

## **EDITOR IN CHIEF**

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